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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/988,594	11/20/2001	Mark A. Livingston	10011693-1	8922

7590 03/19/2004
HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, CO 80527-2400

EXAMINER

ARNOLD, ADAM

ART UNIT	PAPER NUMBER
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2671

DATE MAILED: 03/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/988,594

Applicant(s)

LIVINGSTON, MARK A.

Examiner

Adam Arnold

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: ____.

DETAILED ACTION

The examiner acknowledges the receipt and entry of the applicant's amendment.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 3, 4 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Jeng.

Referring to claim 1, Jeng discloses a user interface for volume sculpting (page 213, last paragraph) comprising a processor, input device and display (page 213, last paragraph, last sentence), where the processor provides multiple views of an object (page 216, paragraph 3), concurrent viewing of different views of the same object (page 213, paragraph 2—i.e., two different views of the same human brain), and where one of the views provides a full six-degree-of-freedom orientation control of the view (page 215, paragraph 2).

Referring to claim 3, Jeng discloses where the second view is fixed in orientation in relation to the first view (paragraph 213, paragraph 2—“positioning and orienting the two physical objects against each other in their hands.”)

Referring to claim 4, Jeng discloses where the second view is fixed in position in relation to the first view (paragraph 213, paragraph 2—“positioning and orienting the two physical objects against each other in their hands.”)

Referring to claim 5, Jeng discloses two different views that are orthogonal (page 215, paragraph 2).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jeng in view of Zilles, U.S. Patent No. 6,369,834. Jeng does not disclose where the first view comprises a cross-sectional area of the object, although it does provide visual examination from an “arbitrary” position (page 215, paragraph 2). Zilles discloses a cross-sectional view of a 3D object (see Figures 6A and 6B). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to show a cross-sectional view of a 3D object. One of ordinary skill in the art would have been motivated to do this in order to provide the user with more visual information in creating a 3D graphical object.

5. Claims 6-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Westermann. Referring to claim 6, Westermann discloses a method of forming a model of a 3D object (Page 100, col. 2, line 2) comprising generating a 3D set of points (or “voxels”—Page 101, col. 2, line 35); grouping the points into 3D cells (Page 101, col. 1, line 41); subdividing a cell into a plurality of cells (Page 101, col. 1, line 10); locating adjacent cells that contact the subdivision

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(Page 102, col. 2, line 11); and subdividing the adjacent cell (Page 102, col. 2, line 12) where the only one voxel is added to adjacent cells (Page 100, col. 2, last sentence—i.e. accessing individual voxel cells to derive a visual mapping), and where it is unnecessary to subdivide any cells beyond the adjacent cells (in light of the fact that Westermann only discusses subdividing adjacent cells in page 102, first paragraph, it is inherent that it is unnecessary to subdivide any cells beyond the adjacent ones). Westermann does not explicitly disclose “dangling points.” At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to subdivide the adjacent cells to eliminate dangling points. One of ordinary skill in the art would have been motivated to do this in order to eliminate visible discontinuities visible as cracks (Page 101, col. 1, line 18).

Referring to claim 7, the remarks presented above with respect to claim 6 apply equally to this claim.

Referring to claim 8, Westermann discloses grouping the points into cubic cells (Page 101, col. 1, line 10).

Referring to claim 9, Westermann discloses subdividing the cell forming 8 subdivisions (Page 101, col. 1, line 9).

Referring to claim 10, Westermann does not disclose where the subdividing cell step forms 12 subdivisions. Westermann does disclose subdividing a cube into 6 pyramids (Page 102, col. 2, line 8). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to subdivide the cell to form 12 subdivisions. One of ordinary skill in the art would have been motivated to do this because if the 6 pyramids were further subdivided,

they would form 12 tetrahedra. This would further serve the purpose of generating a finer level of surface detail.

Referring to claim 11, Westermann discloses where subdividing the adjacent cell is performed automatically (Page 102, col. 2, line 13).

Referring to claim 12, Westermann discloses adding only one point per adjacent cell (i.e., in the center of the adjacent cell--Page 102, col. 2, line 7)

Referring to claim 13, Westermann discloses where the subdividing comprises forming 6 pyramids (Page 102, col. 2, line 8).

Referring to claim 14, the remarks presented above with respect to claim 10 apply equally to this claim.

Referring to claim 15, Westermann discloses removing at least one subdivision from the model (Page 101, col. 1, line 13).

Referring to claim 16, Westermann discloses reproducing at least one of the cells and adding it to the model (Page 102, col. 1, line 7).

Referring to claim 17, Westermann discloses continuing to add subdivisions and cells until a volume defined by the object has been filled (Page 101, col. 2, lines 18-20).

Referring to claim 18, the remarks presented above with respect to claim 6 apply equally to this claim.

Referring to claim 19, the remarks presented above with respect to claim 15 apply equally to this claim.

6. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Westermann in view of Zhou. Westermann does not disclose assigning color values to the set of points. Zhou

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discloses color for generating the 3D volume (page 139, last paragraph). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to assign color values to the points. One of ordinary skill in the art would have been motivated to do this in order to increase visual clarity in complex 3D shapes.

Response to Arguments

7. Applicant's arguments with respect to claims 1-20 have been considered but are generally moot in view of the fact that they refer only to the newly amended claims. In regard to the applicant's claim that Westerman teaches away from the present application (page 9, last two paragraphs and page 11, last two paragraphs), MPEP 2131.05 states that this fact is not germane to a rejection under 102 (or 103). The applicant claims that Westerman teaches away from the present application with regard to figures 3A through 3D which show an adjacent cell subdivision and no subdivision beyond that point (page 9, second full paragraph). The examiner contends that Westermann discloses this point at page 102, col. 2, line 12 where it states that "According to the pattern of hanging nodes from finer neighboring cells that have an edge in common with the current cell, we further split the pyramids." There is no mention of splitting cells other than those with a common edge. In the last paragraph on page 9, the applicant further contends that Westermann teaches "against a conforming split technique" because the number of elements resulting from the split sometimes causes the number of triangles to otherwise increase above that generated for uniform reconstruction on the finest level. This point does not controvert the examiner's contention that claim 6 has been disclosed by Westermann, regardless of any further teaching.

The rejections to these claims stand.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Adam Arnold** whose telephone number is **703-305-8413**. The examiner can normally be reached Monday-Thursday and alternate Fridays between 7:00 AM and 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Zimmerman, can be reached at (703) 305-9798.

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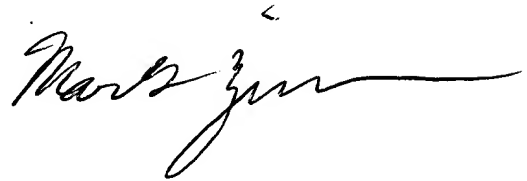
Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive,
Arlington, VA, Sixth Floor (Receptionist).

A handwritten signature in black ink, appearing to read 'Mark Zimmerman', with a long horizontal flourish extending to the right.

MARK ZIMMERMAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600